Technology for the Sound of Music

An instrumental derivative of aerospace technology highlights spinoffs for consumer, home and recreational use

At first blush, guitars and helicopter rotors would seem to have little in common. There is a connection, though: they both vibrate. And that connection proved to be the springboard that launched a most impressive aerospace technology transfer: the development of a line of acoustic guitars and the establishment of a company to market them, a company that has mushroomed over a quarter-century into the world's largest distributor of musical products.

The genesis of the story goes all the way back to 1945 when a 26-year-old aerospace engineer named Charles H. Kaman left his job with a helicopter manufacturer, started Kaman Aerospace Company and began producing helicopters of his own design. Known for their exceptional stability/controllability and for a variety of technological innovations, Kaman's machines quickly moved the company into the upper ranks among the nation's helicopter manufacturers and brought large-scale contracts from the Department of Defense.

But in the early 1960s, in one of those periodic recessions that are endemic to the aerospace/defense industry, Kaman Aircraft saw its largest contract cancelled and the prospects of deep cutbacks in other defense work. The company was forced to diversify into other areas and it was natural that Charles Kaman, a professional caliber guitarist, should turn to musical instruments; he saw that aerospace technology offered a number of ways of substantially improving the sound quality of acoustic guitars.

That's where the vibration connection comes in. Says Charles Kaman:

"In helicopters, the engineers spend all their time trying to figure out how to remove vibration. And to build a guitar you spend your time trying to figure out how to put vibration in. But vibration is vibration. And we had materials coming out of aircraft development that made a vastly better guitar."

A helicopter's rotor system, with thousands of moving parts, is highly susceptible to vibration. For rotor efficiency, vibration must be reduced, or "dampened." NASA, the military services and contractors like Kaman Aircraft had spent years of research toward that end and Charles Kaman turned this vibration dampening technology around and applied it to enhance vibration and thereby produce a guitar with a superior sound.

Kaman and his team of engineers put the quest for sound excellence on a scientific basis, using special vibration analysis equipment patterned on aerospace technology. From two years of vibration analysis, there emerged an innovative, bowl-like guitar that Kaman considered the ideal shape for full, rich and constant tone throughout the instrument's range.

Since wooden guitars sometimes crack, Kaman borrowed again from aerospace research on composite materials for rotor blades and decided on fiberglass for the guitar's surface; it was almost impossible to break, easier to get than rosewood (the traditional material for fine guitars), and it offered advantages in shaping, strength, sound and producibility.

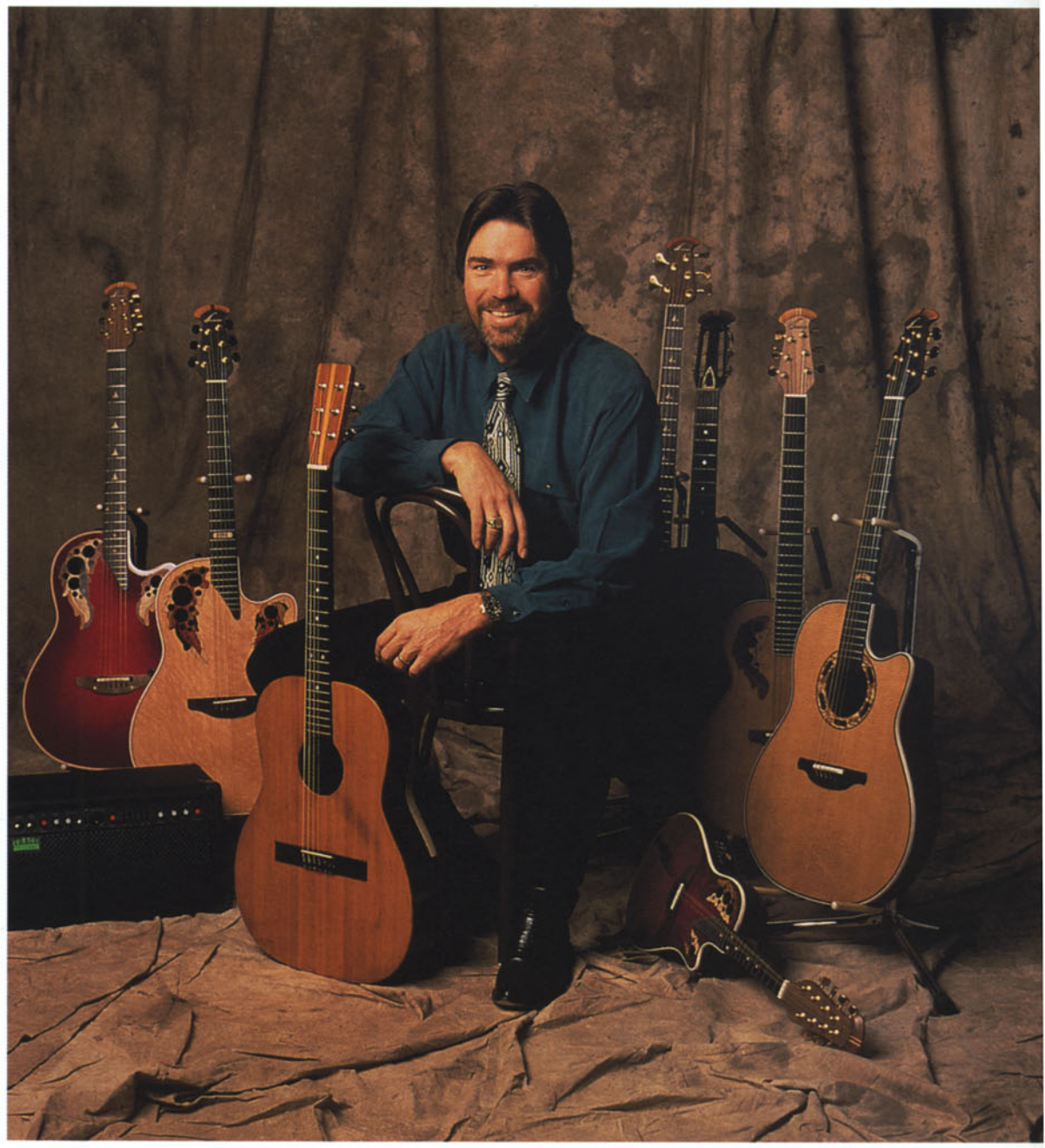
For manufacturing the guitars, Kaman made still another trip to the aerospace technology well and adapted aircraft manufacturing techniques, such as the use of jigs and fixtures, to guitar production. This reduced labor requirements and assured effective quality/cost control in the manufacturing process.

The new guitar got its name when jazz great Charlie Byrd tried out a Kaman instrument and pronounced that it "deserved an ovation." The Ovation® Roundback guitar it became, and Kaman formed Ovation Instruments, Inc. as a subsidiary company.

Ovation guitars were an instant success. Initially, the company produced guitars for the top of the market, mostly for professional entertainers. Later, the advantages of aerospace-derived manufacturing techniques enabled the company to move into the lower-priced fields. Today, Ovation guitars own a large percentage of the acoustic guitar market.

The parent company — now known as Kaman Corporation, Bloomfield, Connecticut —has expanded into a widely-diversified Fortune 500 company with annual sales approaching $800 million. Charles H. Kaman continues as its chairman, but he also follows closely the activities of the music subsidiary.

Ovation Instruments is now a part of a big, multinational manufacturing and distribution entity known as Kaman Music Corporation (KMC), also headquartered in Bloomfield and headed by C. W. "Bill" Kaman, II, son of the founder. KMC has four manufacturing divisions, three distribution divisions and an international marketing group whose combined operations generate annual sales of $100 million.



C. W. "Bill" Kaman, II, president of Kaman Music Corporation, shows off an original Ovation Roundback guitar (center) and some of the company's 1994 line of musical instruments. Bill Kaman is the son of Charles H. Kaman, whose development of a line of guitars based on aerospace technology spawned what is now the world's largest distributor of musical products.

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